

ABSTRACT

The present invention relates to measurement of conductivity, particularly to the noncontact measurement of the conductivity using a microwave. A microwave oscillated by an oscillator (110) using a Gunn diode is applied through an isolator (120), a circulator (130), and a horn antenna (140) to a silicon wafer (150). The isolator (120) is used for reducing the standing wave influencing the operation of the instrument. The reflected wave is received by the same horn antenna (140), detected by a detector (160) connected to the circulator (130), and outputted in the form of a voltage. The detector (160) produces an output voltage proportional to the square of the amplitude of an electric field. Since the amplitude of the reflected wave from a silicon wafer (150) is proportional to the absolute value of the reflectance, the output voltage is also proportional to the square of the absolute value of the reflectance. The reflectance is in a certain relationship with the conductivity, the conductivity of the silicon wafer (150) can be determined.